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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/722,928
Filing Date: November 26, 2003
Appellant(s): SANDEL ET AL.

Wanli Wu
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 7/6/09 appealing from the Office action mailed 8/28/08.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,516,472	LAVER	5-1996
6,042,877	LYON ET AL	3-2000

Dawson-Andoh et al., "Do Fungi Colonize and Discolor Rigid PVC-Wood Flour Composite Lumber?", Abstract from Vinyltec 2003 Conference (2003)

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-6, 8-15, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laver (US Patent 5,516,472), Dawson-Andoh et al. (Abstract from Vinyltec 2003 Conference), and Lyon et al (US Patent 6,042,877).

The claimed invention is drawn to a process for incorporating a metal salt of an antimicrobial onto an outer surface of, or into a porous inner portion of, an extruded or molded plastic product which comprises the steps of providing a metal-containing extruded or molded product, and contacting said product with an aqueous solution of water-soluble biocide to form an antimicrobially protected product having a water-insoluble metal salt of a biocide on the surface, and/or in the porous inner portion, thereof, according to the limitations of claim 1 (see claim 1).

Laver teaches an extruded synthetic wood composition, including a process for the production of a composite material comprising the steps of combining cellulosic material with a sufficient amount of thermoplastic material to form a combined product, and extruding the combined product under sufficient conditions to blend the combined product together into a homogenous mixture (see col. 2, lines 47-52). The composite also contains a lubricant such as zinc stearate (col. 7, lines 18 – 22). This is consistent with Applicant's specification, which teaches that the metal is sometimes incorporated "by means of a functional additive, such as a lubricant" (page 12, lines 19-20), and "These metals are typically present… as stearates… illustrative salts include zinc stearate" (page 13, lines 1-8). The thermoplastic material may be polyethylene (col. 6, lines 48 – 52); polyethylene and zinc stearate are contained in the preferred formulation (col. 7, line 60 – col. 8, line 7). The product is extruded at a temperature between about 100 and 400F (col. 3, lines 20-22); since Applicants have not defined their term "elevated temperature" in the specification, examples, or claims, the term is interpreted to include temperatures between 100 and 400F.

Laver does not teach the step of contacting the extruded product with a water-soluble biocide. However, one skilled in the art would recognize the need to apply a biocidal agent to the product of Laver. As evidence, Dawson-Andoh et al teach that PVC-wood flour composite materials become colonized and discolored upon exposure to fungi (see abstract). Since Laver teaches that PVC is a functional equivalent of polyethylene (see col. 6, lines 48-52), one skilled in the art would recognize the need for a biocide to be applied to a polyethylene composite material.

Lyon et al teach a method for the manufacture of anti-microbial articles comprising rinsing a metal-containing substrate with a potentiator, i.e., an anti-microbial agent (biocide) capable of bonding to the metal ion (col. 4, lines 56-59). For the substrate, Lyon et al. teach that "many types of substrates are suitable for use in this invention…substrates are those considered useful in applications where anti-microbial activity is advantageous" (col. 5, lines 37-40). Also, the substrates may comprise any of a variety of natural or synthetic materials; a particularly useful substrate shape is a fiber made of natural and/or synthetic materials, said natural fibers including pulp fibers (col. 5, lines 55-60). Additionally, the substrate may include thermoplastics such as polyethylene (col. 7, lines 32-33). Suitable potentiators include pyrithiones (col. 5, lines 6-7), and sodium pyrithione is preferred (col. 7, lines 27-30 and Preparative Procedure B, column 8).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to contact the metal-containing substrate of Laver with an antimicrobial agent according to the process of Lyon et al; thus arriving at the claimed invention. One skilled in the art would have been motivated to do so because of the need to protect composite materials from microbial attack is already known, as evidenced by Dawson-Andoh et al, and because contacting the metal-containing substrate with an antimicrobial agent according to the process of Lyon et al provides the benefits of making a durable, long-lasting anti-microbial article which does not require regeneration or further processing of the final article, as taught by Lyon et al (see col. 1, lines 49-51). One skilled in the art would reasonably expect success from applying the

antimicrobial as taught by Lyon et al to the product taught by Laver because both references are drawn to metal-containing substrates which may contain thermoplastics and natural fibers.

Regarding claims 2 and 3, Lyon et al teach that suitable potentiators include pyrithiones (col. 5, lines 6-7), and sodium pyrithione is preferred (col. 7, lines 27-30 and Preparative Procedure B, column 8).

Regarding claims 4 and 5, Laver teaches that the composite contains a lubricant such as zinc stearate (col. 7, lines 18 – 22).

Regarding the amount of metal present on the surface of the extruded product (claims 6 and 8), it is noted that Laver is silent with respect to the amount of metal present on the surface of the extruded product. However, the amount of zinc stearate used to make the product of Laver is 3 parts (per 153 parts total; see col. 7, line 66), or approximately 2%, and the claimed invention uses 2.5% zinc stearate (see Example 1, page 17, line 19 of the specification). Therefore, it appears that the amount of zinc in Laver would produce a product having an amount of metal present on the surface, or in the porous interior portion, within the ranges claimed in claims 6 and 8, and/or one skilled in the art would be motivated to manipulate the amount of zinc by routine experimentation in order to optimize the resultant amount of water-insoluble biocide formed on the surface or in the porous interior portion.

Regarding the water solubility of the water-insoluble metal biocide (claims 9 –11), it is noted that the property of water solubility is inherent within the compound itself;

therefore, the water solubility of the zinc pyrithione of Lyon et al. would necessarily have the same water solubility of the zinc pyrithione of the claimed invention.

Regarding the surface concentration of the water-insoluble metal biocide (claim 12), it is noted that Lyon et al. is silent with respect to the surface concentration of zinc pyrithione. However, the claimed invention uses 0.2 – 2% sodium pyrithione (Example 1, pages 17 and 18 of the specification), and Lyon et al. uses a sodium pyrithione solution adjusted to a pyrithione concentration of 3000 ppm (Preparative Procedure B, column 8), or 0.3%. It appears that the amount of sodium pyrithione in Lyon et al. would produce a product having a surface concentration within the range claimed in claim 12, and/or one skilled in the art would be would be motivated to manipulate the amount of zinc by routine experimentation in order to optimize the resultant amount of water-insoluble biocide formed on the surface or in the porous interior portion.

It is noted that In re Best (195 USPQ 430) and In re Fitzgerald (205 USPQ 594) discuss the support of rejections wherein the prior art discloses subject matter which there is reason to believe inherently includes limitations that are newly cited or is identical to a product instantly claimed. In such a situation the burden is shifted to the applicants to "prove that subject matter shown to be in the prior art does not possess characteristic relied on" (205 USPQ 594, second column, first full paragraph). As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith. *In re Brown,* 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

Regarding the plastic-forming composition (claims 13-15), Laver teaches that the virgin thermoplastic materials may be polyethylene or low density polyethylene (col. 6, lines 48 – 52), or recyclables (see abstract), and cellulosic materials such as wood chips, wood fibers, and wood flour may be used (col. 6, lines 31-36).

Regarding claim 33, Lyon et al teach that, to maximize the anti-microbial activity of the article, the entire available surface of the substrate is preferably exposed to the potentiator (i.e., antimicrobial) solution (col. 5, lines 1-4). An example of this is soaking the substrate in the pyrithione anti-microbial solution for one hour (col. 8, lines 35-37). One skilled in the art would reasonably interpret "entire available surface", contacted by soaking, to include the porous interior portion of the substrate.

(10) Response to Argument

Appellants argue that the combination [of the teachings of Laver and Lyon et al] as applied by the Office Action is improper because such combination ignores one of the two steps mandated by Lyon's disclosed methodology, namely, coating the article with a solution containing a complex of a chelating polymer and a metal ion. Appellants argue that to ignore that step runs counter to the specific teachings of Lyon et al.

This argument is not persuasive because the teachings of Lyon et al are relied upon to show that it is known to apply an antimicrobial solution to a metal-containing substrate, wherein a bond forms between the antimicrobial agent and the metal ion of the substrate. One skilled in the art would find it obvious to apply the step of adding the potentiator, i.e., an anti-microbial agent (biocide) capable of bonding to the metal ion (see col. 4, lines 56-59 of Lyon et al), as taught by Lyon et al, to the substrate of Laver, since the substrate of Laver is already a mixed material which contains a metal ion bound to a polymer (e.g., see the preferred formulation of Laver at col. 7, lines 60 - col. 8, line 7).

Appellants also argue that the chelating polymer of Lyon et al forms a layer of film coated on the surface of the article, which is treated with an anti-microbial agent capable of bonding to the metal ion. Appellants argue that a "chelating polymer-metal ion-potentiator" complex is formed on the surface of the treated article, and submit that it is this complex that confers antimicrobial activity to the finished product.

This argument is not persuasive. Nowhere does Lyon et al teach that a "chelating polymer-metal ion-potentiator" confers antimicrobial activity to the finished product. On the contrary, Lyon et al teach that the selection of potentiator (i.e., anti-microbial agent) is dependent upon the coordination chemistry of **the metal ion**, not the polymer (col. 4, lines 59-61). Lyon et al further teaches that a preferred metal ion is the zinc ion (col. 2, lines 65-66). Since the preferred ion-polymer complex of Laver comprises zinc as the metal ion (columns 7 and 8), and since Lyon et al teach that many substrates are suitable for use in its invention, one skilled in the art would reasonably expect success from the addition of an anti-microbial agent according to the process of Lyon et al to the substrate of Laver. It is further noted that the teachings of Lyon et al referring to the selection of polymer and forming a layer of film (col. 3, lines 1-10) are preferred embodiments of Lyon et al and do not limit the invention of Lyon et al to those embodiments.

In response to Appellant's arguments regarding the teachings of Lyon et al at col. 2, lines 26-37, it is noted that said teaching are preferred embodiments, and do not limit the teachings of Lyon et al to these embodiments. Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or

nonpreferred embodiments. *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). Therefore, the invention of Lyon et al is not limited to chitosan substrates, nor is a chitosan substrate required to confer antimicrobial activity, particularly in light of the fact that Lyon et al teach that the selection of anti-microbial agent is dependent on the metal ion, and not the polymer (col. 4, lines 59-61).

Appellants also argue that, if step (2) of the process disclosed in Lyon et al is applied to the extruded product disclosed by Laver, no chelating polymer-metal ion-potentiator complex would form, because in the extruded product disclosed by Laver, zinc is presented as a zinc salt, namely, zinc stearate, not a zinc-chelating polymer complex disclosed in Lyon et al.

This arguments is not persuasive, since Lyon et al also teach the addition of its zinc ions in the form of a salt, such as zinc acetate and zinc chloride (col. 2, lines 65-67), and, as stated previously, Lyon et al does not teach that the "complex" is what confers the antimicrobial activity, but simply that the potentiator is the anti-microbial agent.

Therefore, it is the Examiner's position that the claims are rendered obvious.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Barbara Frazier/

Examiner, Art Unit 1611

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